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# (54) A CHASSIS FOR A TRAILER

(71) We, ALOIS KOBER KG, a German company of 8871 Kötz 2, Schwaben, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a chassis for a trailer, particularly a caravan.

More particularly, the present invention relates to a chassis comprising at least one rubber suspension arrangement incorporating a support tube, axle-supporting plates to which the support tube is connected at the sides of the chassis, a forked drawbar having members connected to the axle-supporting plates, the axle-supporting plates having webs interengaging with webs of the drawbar members and with webs of the side members, the depth (i.e. vertical extent) of the drawbar members and the depth of the side members increasing towards the axle-supporting plates.

The invention is based on German Registered Design Specification No. 7,010,933, according to which it is known to provide a multisectional chassis for a trailer and to interconnect the sections by means of screws so that the size of the folded chassis packed for dispatch corresponds to the size of the rubber suspension arrangement. Since the stability of the known chassis depends upon the strength of the screwed connections between the individual sections, the stability of the base frame of the trailer body has to be sufficient to ensure that the desired load-carrying capacity can be accommodated by the trailer body.

Furthermore, it is disclosed in German Registered Design Specification No. 7,534,344 to provide arcuate webs the flanges of which contact each other and which are mutually supported by the arcuate portions of the webs, and to make the drawbar members and the side members such that their depths increase towards the middle of the chassis.

It is an object of the invention to provide, at least in the preferred embodiments of the invention, a chassis of minimum dead weight and which requires the minimum of material, which can be dismantled, the chassis requiring very little space when packed for dispatch, which, when combined with a trailer body, is capable of accommodating more than 50%, preferably up to 70% of the load-carrying capacity and, moreover, which may be fitted with either a longitudinal or triangulated control-arm shaft.

Thus, the present invention provides a chassis for a trailer, comprising at least one rubber suspension arrangement incorporating a support tube, axle-supporting plates to which the support tube is connected at the sides of the chassis, a forked drawbar the longitudinal members of which are connected to the axle-supporting plates, and longitudinal side members connected to the axle-supporting plates, the longitudinal members of the drawbar and the longitudinal side members having logitudinally-extending webs, portions of which interengage with webs of the axle-supporting plates, the depth of the drawbar members and the depth of the side members increasing towards the axle-supporting plates, the webs of the drawbar members and the side members being provided with clearances spaced-along the longitudinal direction of the chassis.

The advantage of the invention resides in the fact that it permits the maximum overall height of the individual structural parts to be moved exactly to the position at which the maximum loads are applied and these maximum loads can actually be absorbed at the respective positions, since the connection between the structural parts is not dependent upon the strengtn of the screw elements. The chassis according to the invention has, alone, an inadequate transverse rigidity, since it is braced in the transverse direction solely by the support tube of the rubber suspension arrangement. The total stability results only in combination

with the trailer body the frame of which can be if a lighter construction than hitherto since more than 50% of the load-carrying capacity of the total trailer originate from the chassis. It has even been found in practice that a chassis according to the invention can accommodate up to 70% of the total load-carrying capacity of the trailer.

The transverse bracing of the chassis, which is unstable in this respect, is not reduced by the lighter construction of the trailer bodies according to the invention, since the transverse forces may be readily absorbed by the bottom of the trailer body. On the whole, a considerably lighter trailer is thus obtained there being the additional advantage that either a longitudinal or a triangulated control-arm shaft can be fitted as required without the necessity of having to change the basic concept of the chassis according to the invention.

The invention provides the webs of the side members, the beams of the forked drawbar and, optionally, the axle supporting plates with clearances which are preferably stamped or punched out. This results in a considerable saving of weight without the stability of the chassis being affected, particularly where the portions of the webs defining the upper and lower edges of the clearances project laterally away from the general planes of the webs.

A chassis embodying the invention is described below by way of example with reference to the accompanying drawings, in which:—

Figure 1 shows a side elevation of the chassis;

Figure 2 shows a plan view of the chassis; and

Figures 3 to 5 show sections through the chassis along the lines III–III, IV–IV and V–V respectively of Figure 1.

The chassis shown in the drawings comprises a rubber suspension arrangement incorporating a support tube 1 or 21 (Figures 1 and 2) forming a single cross-connection of the chassis. The ends of the support tube are connected to two axle-supporting plates 2 and 3, preferably by welding to form a sub-assembly, the size of the packed chassis resulting approximately from the size of this sub-assembly. Front end portions 4 of the axle-supporting plates 2 and 3 are inclined towards a drawbar housing 8. Flanged connections 5 by which the beams 6 and 7 of the forked drawbar 6 and 7 are secured in position, are provided in the zone of these portions 4. Side members 9, 10 with flanged connections 5 are screwed to the rear ends of the axle-supporting plates 2 and 3.

Figures 3 and 4 show the individual flanged connections, in which the webs of the axle-supporting plates 2, 3 on one side and the drawbar beams 6 and 7 and side members 9 and 10 on the other side are provided with interengaging truncated-cone-shaped formations 11 and 12 on the conical surfaces of which the structural parts are mutually supported and centred so that the screwed connection 13 has to absorb merely tensile stresses without having to determine the bending and shearing strength of the chassis.

The individual beams 6 and 7 of the drawbar are sheet-steel stampings of an increasing overall depth, the maximum depth being in the zone of the flanged connection 5. The beams 6 and 7 are C-sections (Figure 3), the upper and lower flanges of which are provided with web lugs 25 extending parallel to the webs.

The overall depth of the two axle-supporting plates 2 and 3 also increases from the two ends to the centre, the maximum overall depth being substantially below the support tube, since the maximum forces of the rubber suspension arrangement originating from automotive operation act upon the chassis at that position. The plates 2 and 3 are Z-sections. The upper flanges of the plates 2 and 3 extend flush with the upper flanges of the drawbar beams 6 and 7, the flanges extending in opposite directions as shown in Figure 3. The lower flange of the axle-supporting plates 2 and 3 is relieved in the zone of the flange-connection 5 with the drawbar beams 6 and 7.

The overall height of the side members 9 and 10 also increases from the rear end to the axle-supporting plates 2 and 3 respectively. The side members 9 and 10 are Z-sections (Figures 4 and 5) which are supported on the axle-supporting plates 2 and 3 through the flanges and through the truncated-cone shaped formations 11 and 12, which act as centering means, the flanges having a certain amount of play by which an overdefined position may be avoided. The play may be equalised by the bolted or screwed connection (not shown) between the side members 9 and 10 and the body of the vehicle thus permitting the axle-supporting plates to be braced to the body of the vehicle as well.

The webs of the axle-supporting plates 2 and 3, the drawbar beams 6 and 7 and the side members 9 and 10 are provided with clearances 14 and 15 which, in themselves, appear to be absurd considering the difference in height between the individual structural elements. The stamped-out clearances 14 and 15 result, however, in a considerable saving of weight without any loss of stability, particularly where the portions 16 of the webs defining the clearances 14 and 15 are pressed out from the planes of the webs as shown in Figure 5, resulting in

a considerable stiffening in the zone of the webs.

The connections between the axle-supporting plates 2 and 3 and the side members 9 and 7 respectively forms a step 19 (Figure 1) which can be compensated for by appropriate construction of the base part (not shown) of the body of the trailer. The step 19 is disposed substantially in the vertical plane passing through the wheel axle.

The chassis is provided with a triangulated control arm shaft. The support tube 21 is bent down in the middle at the position 22. Adjoining sections 23 and 24 of the support tube 21 extend at an angle from the middle downwards as well as forwardly in the travelling direction. The sections 23 and 24 are connected, preferably welded, to the axle-supporting plates 2 and 3 in this inclined or sloping position. The advantage thus obtained consists in an improved quality of travelling of the trailer resulting from the triangulated control-arm shaft combined with a considerable saving of weight and high stability of the chassis. The quality of the trailer in general is thus substantially improved. As indicated by dash-dot lines in Figure 1, a rectilinear support tube 1 may be used instead of the support tube 21.

WHAT WE CLAIM IS:—

1. A chassis for a trailer, comprising at least one rubber suspension arrangement incorporating a support tube, axle-supporting plates to which the support tube is connected at the sides of the chassis, a forked drawbar the longitudinal members of which are connected to the axle-supporting plates, and longitudinal side members connected to the axle-supporting plates, the longitudinal members of the drawbar and the longitudinal side members having longitudinally-extending webs, portions of which interengage with webs of the axle-supporting plates, the depth of the drawbar members and the depth of the side members increasing towards the axle-supporting plates, the webs of the drawbar members and the side members being provided with clearances spaced along the longitudinal direction of the chassis.

2. A chassis according to Claim 1, wherein the clearances in the webs of the drawbar members and the side members are defined by portions of the webs which extend out of the general planes of the webs.

3. A chassis according to Claim 1 or 2, wherein the depth of each of the axle-supporting plates increases towards the middle thereof and the webs of the axle-supporting plates are provided with clearances.

4. A chassis according to any preceding claim, wherein each axle-supporting plate has a flange along the upper edge of its web, and wherein the web of each axle-supporting plate overlaps the web of a respective one of the drawbar members, the flanges of the axle-supporting plate and the drawbar member being flush with each other and oppositely directed in the region of overlap.

5. A chassis according to Claim 4, wherein each drawbar member has a flange along the lower edge of its web, the flange not extending into the region of overlap.

6. A chassis according to any preceding claim, wherein each side member has a flange along the upper edge of its web and a flange along the lower edge of its web, the flanges being oppositely directed, and each axle-supporting plate has a flange along the upper edge of its web and a flange along the lower edge of its web, the flanges being oppositely directed, and wherein the web of each axle-supporting plate overlaps the web of a respective one of the side members, the upper and lower flanges of the side member respectively engaging over the upper and lower flanges of the axle-supporting member in the region of overlap, play between the flanges being allowable.

7. A chassis according to any preceding claim, wherein the support tube comprises two portions each of which extends downwardly and forwardly away from the mid-point of the tube.

8. A chassis according to any preceding claim, wherein the debs of the axle-supporting plates interengage with the webs of the drawbar members and the webs of the side members by means of complementarily shaped non-flat formations.

9. A chassis according to Claim 1, substantially as described herein with reference to and as illustrated in the accompanying drawings.

10. A trailer comprising a chassis according to any preceding claim and a body mounted on the chassis.

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1562883 COMPLETE SPECIFICATION

2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 1

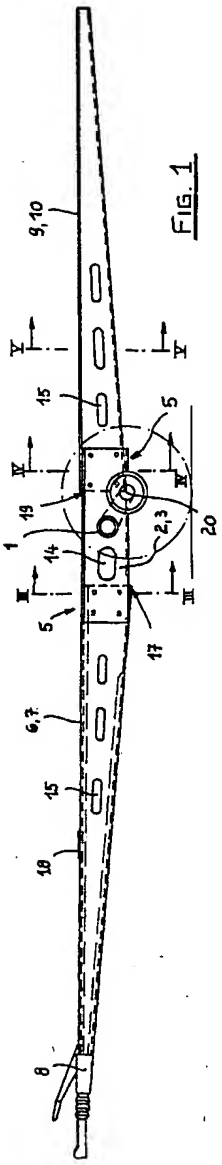


FIG. 1

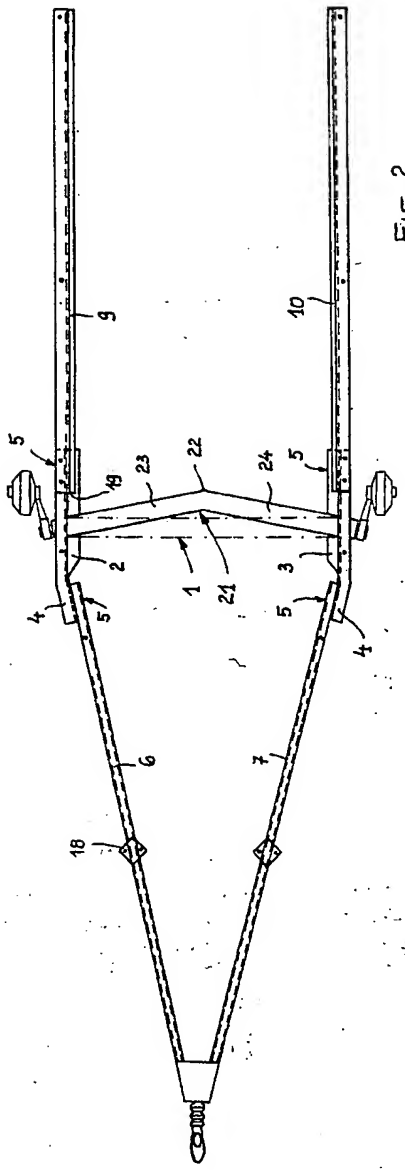


FIG. 2

1562883 COMPLETE SPECIFICATION
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Sheet 2

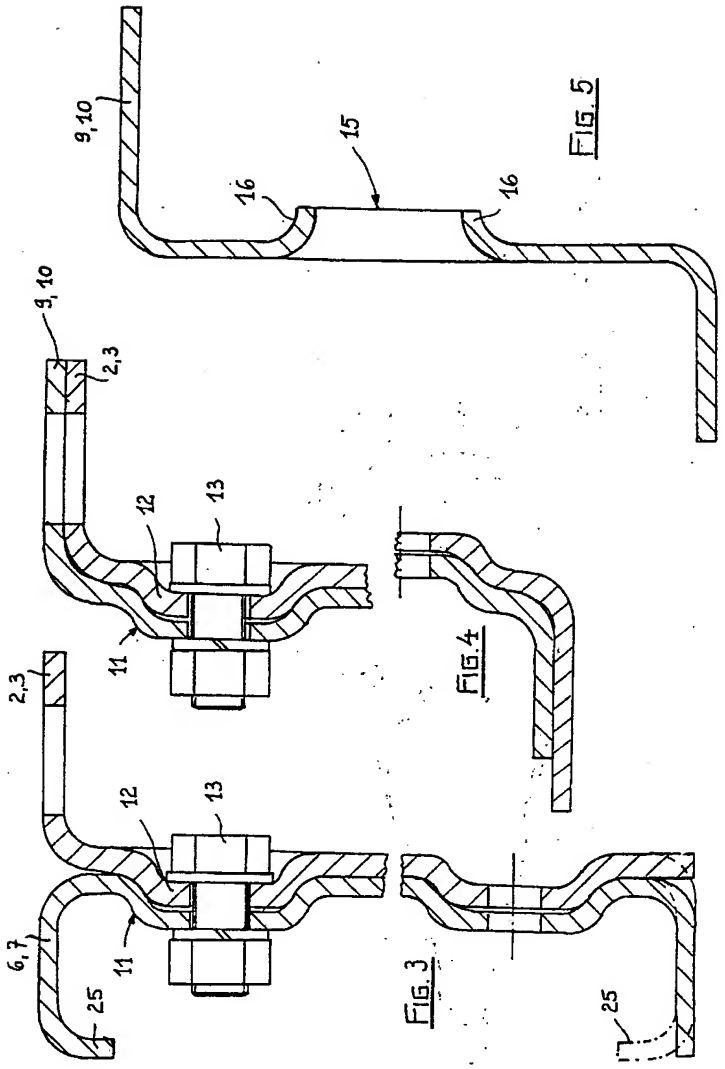


FIG. 5

FIG. 4

FIG. 3